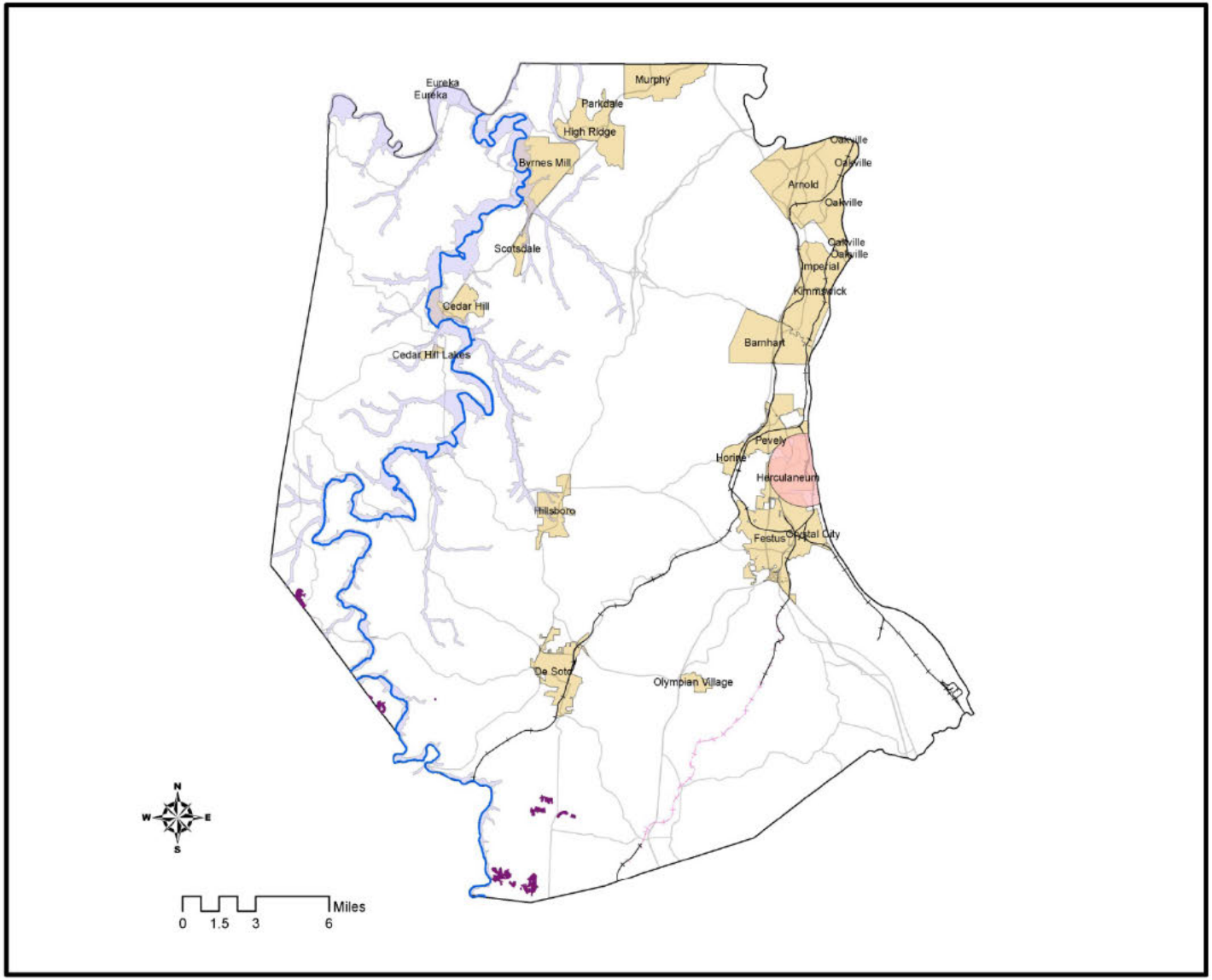
Southwest Jefferson County Mining Site

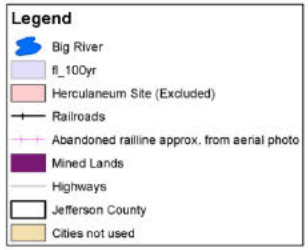
OU-1 – Residential Soils (Historic Mining)

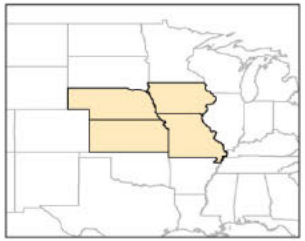
OU-2 – Residential Soils (Luebbers)

OU-3 – Residential Soils (Stewart)

Southwest Jefferson County Mining Site







Created By: Preston Law
Date:04/23/12
FileName:
Big_River_Master_JeffCo

Southwest Jefferson County Mining Site Residential Soils Operable Units Description

OU1 – Residential Soils- Historical Mining

- Includes all properties within Jefferson County that have lead contamination in their soils of 400 ppm or greater in at least one quadrant and are not included in OU2, OU3 or the Herculaneum Smelter Site.
- Significant contamination areas include the Big River and the Big River 100-year floodplain in Jefferson County. Approximately 2,500 residential parcels are identified within the floodplain, with 168 sampled (43% return ≥ 400 ppm.

OU2 – Residential Soils- Luebbers

- Includes all properties within Jefferson County identified as having lead contaminated soils of 400 ppm or greater in at least one quadrant and have been hauled by Luebbers Trucking . 122 properties are associated with this OU.

OU3 – Residential Soils- Stewart

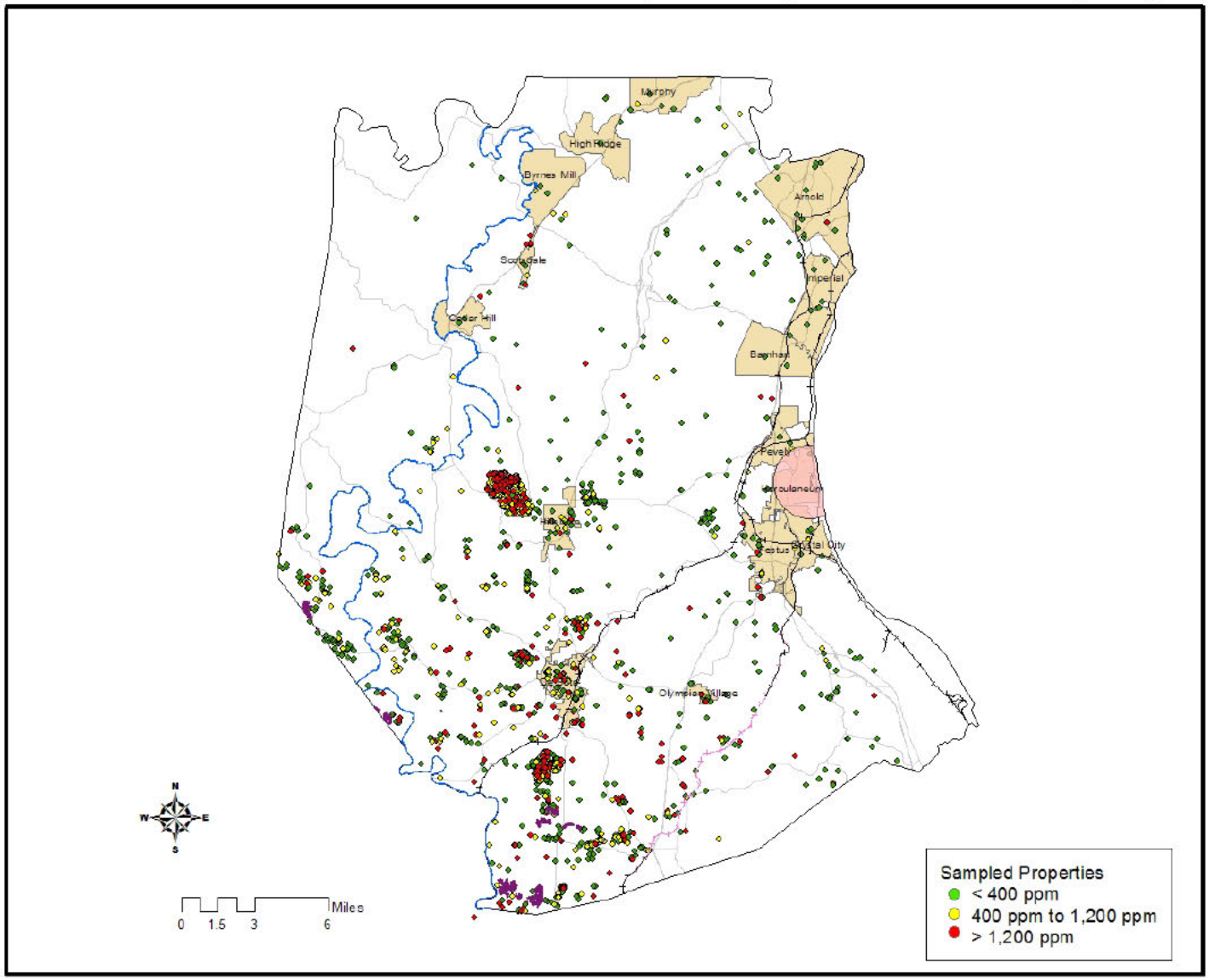
- Includes all properties within Jefferson County identified as having lead contaminated soils of 400 ppm or greater in at least one quadrant and have been sold by Stewart Farms. 337 properties are associated with this OU.

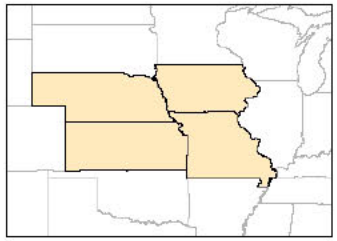
Southwest Jefferson County Mining Site Residential Soils Current Status

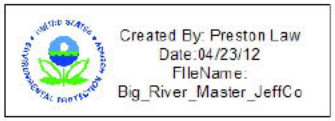
A total of 2,070 properties were screened at the site during the removal, with contracts ongoing to perform additional sampling of 500 additional properties.

- OU1 - 1,611 properties sampled
  - 162 Time Critical (≥1,200 ppm)
  - 409 Non-time critical (400 ppm to 1,200 ppm)
- OU2 - 122 properties sampled
  - 82 Time Critical (≥1,200 ppm)
  - 9 Non-time critical (400 ppm to 1,200 ppm)
- OU3 – 337 properties sampled
  - 120 Time Critical (≥1,200 ppm)
  - 56 Non-time critical (400 ppm to 1,200 ppm)

Southwest Jefferson County Mining Site - Soil Sampling







Southwest Jefferson County Mining Site Residential Soils Current Status

- In addition to removal sampling performed, EPA has ongoing contracts for soil and groundwater sampling at the Site

- 168 Properties have been sampled in the Big River 100-year floodplain
  - 43% were contaminated ≥400 ppm in the floodplain
  - 78% were contaminated ≥400 ppm that were directly on the river.

- 114 Properties have been sampled in the southwest quadrant of the Site
  - 25% were contaminated ≥400 ppm

Southwest Jefferson County Mining Site Additional Operable Units

In addition to residential soils there are additional operable units on site that may pose risk to human health and the environment. These operable units are going through the remedial process and are in various stages

OU4 – Unconsolidated Mine Waste (Big River)

- 50 Miles of River and Floodplain containing an estimated 71 million tons of contaminated sediment and soil, resulting from historic mine waste piles eroding into the river.
- Undergoing both Human Health and Ecological Risk Assessments

OU5 – Groundwater

- 76 Wells exceeding Lead action levels of 15 PPB
- RI Completed

OU6 – Valles Mines

- 4,500 acres mine area owned by single PRP, 104e sent and response received

OU7 – Rail Lines

- 30+ miles of rail lines made with mine tailing ballast
- Undergoing both Human Health and Ecological Risk Assessments

OU8 – Mine Waste Piles

- Three primary area consisting of legacy material from Barite Mines
- Undergoing both Human Health and Ecological Risk Assessments

Risks to Human Populations Exposed

- Jefferson County Population – 219,480
- Median Family Income – $56,400
- 10.3% of Families below poverty level
- 15.8% of Families with children 5 years and younger below poverty level
- 14,859 children under age of 5 years
- 15,076 children 5 to 9 years of age

Source - http://quickfacts.census.gov/qfd/states/29/29099lk.html

Risks to Human Populations Exposed

- Direct exposure to lead contaminated surface soil on residential properties
- Observed elevated blood lead levels in children due to lead contaminated soil (no LBP present)
- Concentrations above level that will cause an EBL level in a child (IEUBK)
  - Site specific IEUBK model gave P10 > 5% at soil concentration of 400 ppm
  - Collocated COCs arsenic and chromium have cancer and non cancer risk at concentrations above 22 ppm and 29 ppm, respectively .
- Lead contamination risk exists due to lead in dust from track-in and wind erosion

Site and Contaminant Stability

- Lead in yard soil is available to children on toys and hand to mouth behavior
- Lead is mobilized through track-in by residents and pets and wind borne creating additional dust exposure
- Soil erosion can move contaminant
- Materials can be relocated manually, particularly from the Big River and sold as topsoil
- Mine waste piles primarily in southwest quadrant of County
- No ICs for use of mine waste for construction purposes

Contaminant Characteristics

- Lead, Arsenic, and Chromium COCs in yard soil
  - Site lead levels exceed 400 ppm, children have greater than a 5 percent chance of exceeding a blood lead level of10 ug/dl which is associated with adverse health outcomes such as neurological damage.
  - Collocated levels of COC arsenic exceed 22 ppm level associated with non cancer risk
  - Collocated levels of COC chromium exceed 29 ppm level associated with cancer risk of 10E-4
- Lead bioavailability is at or above IEUBK default value
- Biodegradation will not take place
- Adhere to soil particles

Threats to the Environment

- OU1 includes residential properties within the flood plain of Big River and excavation activities could cause contamination to mobilize by erosion and manual relocation of soils and sediment creating risk to riparian habitat

Programmatic Considerations

- Missouri considers the cleanup of legacy mine sites to be its number one environmental priority
- Large number of mines in southeast Missouri from 1700s to 1900s.
- Contamination at a residence could be from any number of historic mines in the area or the Big River watershed.
- Properties associated with OU1 have no direct evidence of source.

Programmatic Considerations

- Additionally, there are a small number of barium mines
- Exemption 5: AC/AWP
- The removal program has limited ongoing activities but is no longer sampling new properties .
- There are an estimated 875 contaminated residences that will require remediation.